**Fractional Frequency Shifts of Local Helioseismic Modes With Magnetic Activity Using Ring-Diagram Analyses**

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Using full-disk Doppler velocity data from SOI-MDI during the advancing solar cycle from 1996 through 1999, we have computed the local frequencies of high-degree p modes and f modes over a dense mosaic of localized regions of the sun using ring-diagram analysis. The motion of active regions as they rotate across the solar disk is well traced by changes in the frequencies. Active regions appear as locations of large positive frequency shifts. Depending on the radial order and wavenumber of the observed acoustic modes the frequency shifts can be as much as 10 to 30 microHz. Shifts of this amplitude are 20 to 60 times larger than the shifts in global acoustic oscillations.

The magnitude and frequency dependence of the large frequency shifts are consistent with those measured in global modes provided the local frequency shifts are averaged over the solar disk and are scaled to the appropriate wavenumber regimes. The frequency dependence of the shifts indicates that the physical phenomena inducing them is largely confined to the surface layers of the sun, although there is some indication that there may be a deeper structural component as well. These local area samplings may help to understand the restructuring of the near-surface layers of the convection zone by magnetic fields.